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Claims (clean)

1. (currently amended) A system for optimizing a performance of an operating crew of at least one aerial vehicle during at least one close-in air combat the system comprising:
an assessment information database implemented on at least one computer; and
an assessment and guidance software application implemented on the at least one computer for providing in real-time automatic situation assessment, generating dynamically at least one indication related to the at least one close-in air combat and communicating the at least one indication as guidance to the operating crew of the at least one aerial vehicle, wherein said automatic situation assessment relates to a situation of a dog fight air combat between two aircraft vehicles.
2. (Currently amended) The system as claimed in claim 1 wherein the assessment information database comprises:
an aircraft characteristics file comprising an aircraft flight envelope, aircraft maneuver-energy graphs, models and limitations, and aircraft weapon system characteristics;
a set of formulas for an optimal relative maneuvering file; and
an external information file.
3. (Currently amended) The system as claimed in claim 1 further comprises at least one computer installed on the at least one aerial vehicle or on at least one ground station to receive, store, process and forward data specific for optimization of a conduct of an at least one aerial engagement.
4. (currently amended) The system as claimed in claim 1 further comprising at least one off-board computer installed in at least one ground station to provide additional data specific for optimization of a conduct of the at least one close-in air combat.
5. (Currently amended) The system as claimed in claim 1 further comprising at least one sensor device installed on the at least one aerial vehicle to dynamically monitor physical variables associated with aircraft vehicles participating in the at least one close-in air combat.

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6. (Currently amended) The system as claimed in claim 1 further comprising at least one sensor device installed in an at least one ground station to monitor physical variables associated with t aircraft vehicles participating in the at least one close-in air combat.

7. (Currently amended) The system as claimed in claim 1 further comprising at least one data communication network linking the at least one aerial vehicle and an at least one ground station to allow for transmission or reception of information associated with the at least one close-in air combat.

8. (Currently amended) The system as claimed in claim 1 wherein the assessment and guidance software application comprises:

- an application control module to initiate, to activate, to control and to execute the assessment and guidance software application;
- a database interface module to allow for access the assessment information database and to obtain records from the assessment information database;
- a parameters processor module to handle operational parameters of the aircraft vehicle;
- a situation analyzer and mapping module to analyze at least one situation concerning the at least one close-in air combat; and
- a response assessment and response selector module to generate or select at least one response associated with an at least one current situation and an at least one potential situation.

9. (Currently amended) The system as claimed in claim 8 wherein the assessment and guidance software application further comprises:

- a future situations projector and mapping module to create at least one potential future situation and associating the at least one potential future situation with the at least one current situation;

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a guidance generator module to convert at least one selected response to at least one guidance instruction;
a guidance display module to communicate at least one guidance instruction to the operating crew;
an aircraft status and system status monitor;
a learning and adaptation module;
a history generator and history replay module;
a set of rules module or algorithm;
a testing/maintenance/initialization module; and
a user interface module.

10. (Currently amended) The system as claimed in claim 1 wherein the at least one computer further comprises the elements of:

a communication device to link the at least one computer to remote information sources via an at least one data communication network;
a processor device to execute a sequence of software instructions embedded in the assessment and guidance software application;
digital signal processor device to process digitally formatted information from an at least one sensor device and from an at least one data communication network; and
a data bus device to provide at least one data delivery channel among devices installed in an at least one on-board device.

11. (original) The system of claim 10 further comprising a sound synthesizing device to generate audio instructions to be communicated to the operating crew of the least one aerial vehicle.

12. (Currently amended) The system as claimed in claim 8 wherein the assessment and guidance software application further comprises any one of the elements of:

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an operating system to supervise and control execution of programs installed in the at least one computer;
a data link handler component to initiate transmission of outgoing information and to receive incoming information from an at least one data communication network;
an input/output handler component to supervise and control peripheral devices linked to the at least one computer;
a database handler component to initiate access to the assessment information database.

13. (original) The system as claimed in claim 11 wherein the sensor device is an instrument providing an indication as to parameters of flight.

14. (original) The system as claimed in claim 11 wherein the sensor device is a global positioning system device.

15. (cancelled)

16. (original) The system as claimed in claim 1 wherein the at least one aerial vehicle is an unmanned combat aerial vehicle.

17. (cancelled)

18. (original) The system as claimed in claim 1 wherein the operating crew is a remotely located operator.

19. (original) The system of claim 3 wherein the at least one computer is an onboard computer located within the at least one aerial vehicle.

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20. (Currently amended) The system as claimed in claim 1 further comprises a visual display device to communicate an at least one instruction to the operating crew in a visual manner.

21. (Currently amended) The system as claimed in claim 1 further comprises an audio output device to communicate an at least one instruction to the operating crew in an aerial manner.

22. (Currently amended) The system as claimed in claim 1 further comprises a manual input device to communicate control information from the operating crew to the system.

23 - 26. (cancelled)

27. (Currently amended) A method for optimizing a performance of an operating crew of at least one aerial vehicle during at least one close-in air combat by providing in real-time automatic situation assessment data and by generating dynamically at least one instruction and by communicating the at least one instruction as guidance to the operating crew of the at least one aerial vehicle, the method comprising the steps of:

for each one of at least two aerial vehicles:

obtaining air combat engagement and energy information required for analysis of the air combat situation;

obtaining aircraft characteristics information required for the analysis of air combat situation;

obtaining aircraft weapon system characteristics information; and

obtaining remotely sensor-specific information;

analyzing the situation between the at least two aerial vehicles and mapping the analyzed situation in relation to previously analyzed situations between the at least two aerial vehicles;

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determining at least one optimal state of the at least one aerial vehicle based on the at least one optimal air combat situation between the at least two aerial vehicles;
generating at least one recommendation concerning a preferred maneuvering of the at least one aerial vehicle based on the analyzed situation between the at least two aerial vehicles, aircraft characteristics and aircraft weapon system characteristics information.

28. (Currently amended) The method as claimed in claim 27 further comprises the steps of:

transforming the at least one recommendation into at least one guidance indicator;
displaying the at, least one guidance indicator to the operating crew of the at least one aerial vehicle to enable an application of associated commands to the controls of the aerial vehicle.

29. (Currently amended) The method as claimed in claim 27 further comprises transforming the at least one recommendation into at least one direct input commands to be automatically applied to suitable controls of the at least one-aerial vehicle.

30. (Currently amended) An apparatus for optimizing the performance of an operating crew of at least one aerial vehicle during at least one close-in air combat by providing in real-time automatic situation assessment, the apparatus comprising:

a device for: obtaining air combat engagement and energy information required for analysis of the air combat situation;
obtaining aircraft characteristics information required for the analysis of the air combat situation;
obtaining aircraft weapon system characteristics information; and
obtaining remotely sensor-specific information;
an analysis device for:

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analyzing the situation between the at least two aerial vehicles and mapping the analyzed situation in relation to the previously analyzed situations between at least two aerial vehicles;

based on the analysis determine at least one optimal state of the at least one aerial vehicle based on the at least one optimal air combat situation between the at least two aerial vehicles; and

generating at least one recommendation based on the at least one optimal future potential air combat situation between the at least two aerial vehicles.

31. (original) The apparatus as claimed in claim 30 further comprises:

a transforming device for transforming at least one recommendation into at least one guidance indicator; a display device for displaying the at least one guidance indicator to the operating crew of the at least one aerial vehicle to enable the application of the associated commands to the controls of the aerial vehicle.

32. (original) The apparatus as claimed in claim 30 further comprises a transforming device for transforming the at least one recommendation into at least one direct input commands to be automatically applied to suitable controls of the at least one aerial vehicle.

33. (Previously added) The system as claimed in claim 1, further comprising an identifying element for identifying the aerial vehicle.

34. (Previously added) The system as claimed in claim 1, wherein the assessment and guidance software application provides accurate speed and direction guidance.

35. (Currently amended) The system as claimed in claim 1, wherein the assessment and guidance software application provides guidance according to a flight path of an adversary aircraft.

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36. (Previously added) The system as claimed in claim 1, wherein at least a portion of the situation assessment is a function of ammunition data.